Grade 11 University Biology

UNIT TEST: BIOCHEMISTRY

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| --- | --- | --- | --- | --- |
| **Knowledge and Understanding**  **/25** | **Application**  **/10** | **Communication**  **/5** | **Thinking and Inquiry**  **NA** | **TOTAL**  **/40** |

KNOWLEDGE AND UNDERSTANDING

Part I: Multiple Choice **/10**

Read each question carefully and choose the BEST answer.

1. The organelle responsible for controlling the functions of a cell is:
2. rough endoplasmic reticulum
3. nucleus
4. nucleolus
5. chromosomes
6. none of the above
7. Which if the following changes the rate of enzyme catalyzed reactions?
8. increasing the concentration of substrate
9. adding an inhibitor
10. changing the pH
11. increasing the temperature
12. all of the above
13. Which of the following compounds is a polysaccharide that is not digestible by humans?
14. glucose
15. glycogen
16. glycolysis
17. cellulose
18. none of the above
19. Which of the following is correct?
20. –C=O is an aldehyde.
21. –COOH is a carboxylic acid.
22. –C=N is an amine.
23. –COOH is a hydroxyl.
24. All of the above
25. The most common catabolic reaction in the human body is:
26. hydrolysis
27. condensation
28. substitution
29. dehydration
30. all of the above
31. Which of the following is NOT a membrane bound organelle?
32. Golgi bodies
33. Vesicles
34. Smooth endoplasmic reticulum
35. Ribosomes
36. None of the above
37. Amino acids are the building blocks of which of the following:
38. Carbohydrates
39. Lipids
40. Polypeptides
41. All of the above
42. None of the above
43. Non-competitive inhibition is when:
44. The inhibitor binds to an enzyme at a spot other than the active site
45. The inhibitor binds to an enzyme at the active site
46. The inhibitor does not bind to the enzyme at all, just chemically alters the enzyme to prevent activity
47. The inhibitor does not prevent the substrate from binding
48. Both a and d.
49. Based on you Diffusion and Osmosis Gizmo labs, the cell membrane is:
50. semipermeable
51. impermeable
52. permeable
53. finitely permeable
54. none of the above
55. Which of the following is a list of various lipids:
56. Insulin, triglyceride, cholesterol
57. Fatty acids, phospholipids, glycine
58. Glycogen, fatty acids, cholesterol
59. Steroids, triglycerides, fatty acids
60. None of the above

Part II: True and False **/10**

State whether true or false. If false, write the correct version of the statement.

1. For humans, there are 10 essential amino acids. \_\_\_\_\_\_\_

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1. The monosaccharides glucose and fructose form the disaccharide, sucrose (table sugar).\_\_\_\_

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1. Based on the fluid mosaic model, cholesterol is known to modulate fluidity of the cell membrane.\_\_\_\_\_\_\_\_

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1. In the lock and key model, an enzyme binds with a product to form the enzyme-product complex. \_\_\_\_\_\_\_\_

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1. In a cell, the organelles that produce the energy supply are the mitochondria. \_\_\_\_\_\_\_\_

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Part III: Short Answer

1. What are the essential amino acids? List them. **/2**
2. Differentiate anabolic versus catabolic reactions. **/2**
3. Define allosteric regulation. **/1**

APPLICATION

Answer the following questions.

1) List some applications of biochemistry you have learned in this unit (i.e. in food, pharmaceuticals, technology sector etc.). **/5**

2) Is synthetically produced Vitamin C (i.e. man-made) different from Vitamin C extracted from organic fruits/vegetables? Discuss, drawing upon what you have learned in class. **/5**

COMMUNICATION

1. Draw the condensation reaction of two cyclic glucose molecules forming the dissacharide maltose. Label each molecule. (Make sure the structure of the glucose molecules are drawn properly. Marks will be deducted if hydroxyl groups are not situated correctly above and/or below the ring). **/5**

ANSWER SHEET

KNOWLEDGE AND UNDERSTANDING

Part I: Multiple Choice

1. b

2. e

3. d

4. b

5. a

6. d

7. c

8. e

9. a

10. d

Part II: True and False

11. F. There are 8 essential amino acids.

12. T

13. T

14. F. Enzyme binds with a substrate to form the enzyme-substrate complex.

15. T

Part III: Short Answer

16. The essential amino acids are:

Isoleucine

Leucine

Lysine

Methionine

Phenylalanine

Theonine

Tryptophan

Valine

17. Anabolic- reactions involved with molecular synthesis

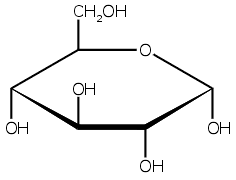
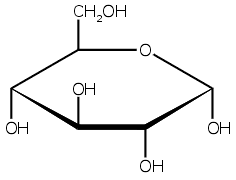
Catabolic- reactions involved with molecular degradation

18. Allosteric regulation- when molecules bind to enzymes (competitively or non-competitively), changing enzyme conformation and thus changing enzyme activity (can activate or inhibit).

APPLICATION

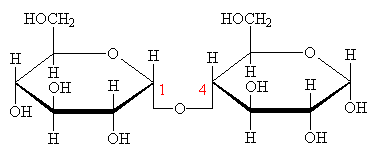
1. e.g, vitamin/pharmaceutical production; nutrition and determining the chemical composition of food; determining the affects of medical drugs on the human body; determining the affects of pesticides on plants;
2. There is no difference between man-made Vitamin C and naturally derived Vitamin C. They both have the exact same chemical structure, so they will behave in the same way and interact with the body in the same way.

COMMUNICATON



**+**

↓



+ H2O